

Recommending by Visualizing Fellow Travelers

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ABSTRACT

A problem when making recommendations based on the aggregated behavior of many users (collaborative recommendation) is to explain the rationale behind the recommendation. Our work investigates the alternative approach of visualizing the collaborative data, leaving it to the user to decide on a course of action, i.e. create the recommendation. A prototype system was built and evaluated in a joint project with the international transport and travel service company Stena Line. A user study showed that displaying statistics on other traveler's ticket bookings indeed functioned as recommendations.

Keywords

On-line travel booking, recommender system, collaborative recommendation, social computing.

BACKGROUND

In real life, people are social beings, interested in the behavior of others. We follow trails, we go where the action seems to be, and we buy the same kind of things that our friends buy. *Social computation* attempts to transfer these mechanisms into the design of computer systems.

Recommendation is a widely used social functionality on the web [3]. The items recommended may be books or records, documents in a search system, steps to take in problem solving, or ways to go in a maze. The actual recommendation might be given by a specific person (such as a movie critic recommending movies), be based on sales records (e.g. top-10 lists) or come from some more advanced usage patterns such as the "people who bought this also bought that" functionality of e.g. Amazon.com.

The most prominent trend in recommender systems is to give a suggestion of what item to choose, or what action to take. However, for recommendations to really work it is crucial that the rationale behind the recommendation is understood [2]. When a friend recommends a book to you, the recommendation is based on your friend's knowledge about you. A top-10 list is based on the most popular choices. However, if a booking system recommends you to add a cabin to your ferry ticket booking, why is this recommended to you?

In a joint project with Stena Line, an international transport and travel service company and one of the world's largest ferry operators, we developed and tested a prototypical

social component based on booking statistics, to be run on their on-line ticket booking site (<http://www.stenaline.com>).

We explored a way to avoid the problem of explaining recommendations by taking a different approach. Instead of recommending by making a suggestion, we presented background information directly to users, leaving it to them to form their own decision. In other words, we attempted to make other ferry travelers visible to the person booking a ticket, allowing for social behavior.

Our hypothesis was that statistical information such as group constellation, age, gender, meal and cabin booking for the trip, associated hotel, excursion and ticket bookings would be considered useful in an on-line booking service. More specifically, we hypothesized that such an approach would provide useful support for making the different selections needed in travel booking.

THE PROTOTYPE SYSTEM

A pre-study questionnaire indicated a strong general interest in statistics about fellow travelers (54 of 81 respondents), supporting our belief in the statistics approach. In particular, information about group constellation and age was considered as potentially useful.

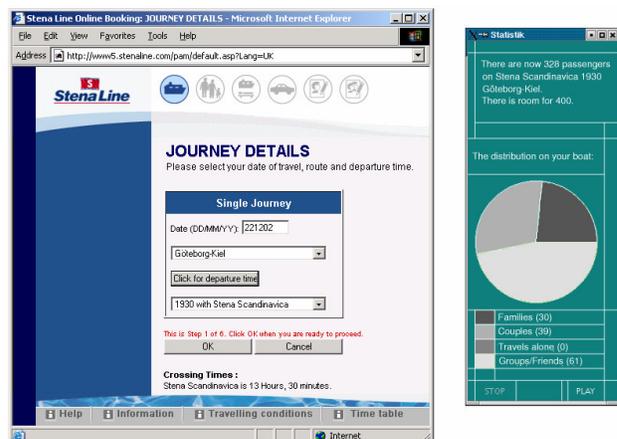


Figure 1 Stena Line's on-line booking window to the left, the prototype statistics display to the right.

We developed a social interface component displaying fake but realistic statistical information about a limited number of ferry departures (Figure 1). The prototype was constructed to be used for a user study. It was designed for use together with Stena Line's actual on-line booking site, which limited our choice of statistics to display: distribution

over age, gender and group constellation (single, group, family...) once the departure was selected; and vehicle, cabin, and meal bookings at appropriate stages of the booking process.

For many reasons, the prototype was implemented as a separate system from the live Stena Line booking web site. The statistics were presented in a separate window, controlled by a wizard [1] on a different computer.

USER STUDY SETUP

Subjects were placed in front of a screen and keyboard. The test leader was seated next to the subject. The wizard, who was introduced as a technical supervisor, was seated behind the subject.

Seven subjects were given two ticket booking tasks, one at a time, in varying order. The tasks were presented as mini-scenarios, giving most but not all information needed to accomplish the task. One task was to book a day cruise with a friend, and the other to arrange transport for a family.

Subjects were minimally instructed and asked to "think aloud". According to a form, the test leader looked for certain user behavior, in particular when and to what extent the social component was noticed and used. If not noticed at all for the first task, the subject was instructed to give special attention to the social component in performing the second task. After the second task, subjects were asked to fill in an on-line form. Comments were encouraged all through the 20-40 minutes long process, which was also recorded on video.

The study was performed in Swedish. Quotes from subjects have been translated into English.

USER STUDY RESULTS

All subjects were overwhelmingly positive towards the idea of supporting the on-line booking process with relevant social information.

We found strong evidence that subjects did use the statistics as a basis for their selections in the on-line booking:

A: "What about the other departure then? Not very many children, lots of noisy people, nah, we'll take the early boat"

B: What did the others book here? [about cabins]

We also found support for our hypothesis that users would form their own decisions based on background information. Statistics were used to decide both for and against booking choices:

C: "... the others didn't book cabins, we don't need that either"

D: "... 'meal booking', no we won't do that. What did the others do? Brunch, aha. Maybe we should have that then ..."

The statistics also promoted some booking choices that happened to be less visible in the interface:

E: "Aha, breakfast... where do I book that?"

Some subjects did not pay much attention to the statistics unless prompted to do so. Most of this effect can probably be attributed to the statistics being displayed in a different window from the on-line booking, for technical reasons. Interestingly enough, one subject was very enthusiastic about the prototype, and was totally unaware that she only used the statistics on demand.

None of the subjects in our study felt disturbed by the statistics window, and they experienced very few problems in understanding the information presented there.

CONCLUSIONS

We set out with the hypothesis that an on-line booking system would benefit from making other people's bookings visible in the form of statistics. In conclusion, the results from our study show substantial support for this hypothesis:

- Study subjects were very positive and intuitively liked the approach.
- They had no problem in understanding the information displayed.
- Subjects did form their own recommendations.

Finally, the approach of displaying booking statistics gave promotional effects in that less visible interface selections were made apparent.

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